

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

Claim 1 (Currently Amended): A microphone unit comprising:

an electret capacitor having first and second electrodes;

~~an~~ a transistor amplifier with which voltage generated between said first and second electrodes of said electret capacitor is amplified and then outputted to an output of the microphone unit; and

at least one operational amplifier connected to the transistor amplifier and receiving the amplified voltage; and

an external capacitor having,

a first electrode to which ~~an output of the amplified voltage from said transistor~~ amplifier is applied through the at least one operational amplifier, and

a second electrode connected to said first electrode of said electret capacitor off ground.

Claim 2 (Currently Amended): The microphone unit according to Claim 1, wherein said transistor amplifier comprises:

a first transistor having a first current electrode, a second current electrode connected to said second electrode of said electrode capacitor, and a control electrode connected to said first electrode of said electret capacitor; and

a current source connected to said first current electrode of said first transistor,
wherein

said at least one operational amplifier comprises an inverting amplifier having an input terminal connected to said first current electrode of said first transistor.

Claim 3 (Original): The microphone unit according to claim 2, wherein said inverting amplifier comprises:

a first resistor having a first terminal connected to said first current electrode of said first transistor, and a second terminal;

a first operational amplifier having a negative input terminal connected to said second terminal of said first resistor, a positive input terminal to which a first fixed potential is applied, and an output terminal; and

a second resistor having a first terminal connected to said negative input terminal of said first operational amplifier, and a second terminal connected to said output terminal of said first operational amplifier.

Claim 4 (Previously Presented): The microphone unit according to claim 2, wherein said current source comprises:

a second transistor having a first current electrode to which a first fixed potential is applied;;

a second current electrode connected to said first current electrode of said first transistor;; and

a control electrode to which a second fixed potential is applied.

Claim 5 (Currently Amended): The microphone unit according to Claim 2, wherein said at least one operational amplifier further comprises a voltage follower having an input terminal connected to said first current electrode of said first transistor, and an output terminal connected to said input terminal of said inverting amplifier.

Claim 6 (Original): The microphone unit according to claim 2 further comprising:
a first diode having a cathode and an anode connected to said first and second electrodes of said electret capacitor, respectively;
a second diode having an anode and a cathode connected to said first and second electrodes of said electret capacitor, respectively; and
a third resistor connected in parallel with said electret capacitor.

Claim 7 (Withdrawn): A microphone unit comprising:
a semiconductor substrate to which a fixed potential is applied;
an insulating layer disposed above said semiconductor substrate;
an electret capacitor having a first electrode disposed above said insulating layer, and a second electrode that is free to oscillate and spaced apart from said first electrode;
an amplifier with which voltage generated between said first and second electrodes of said electret capacitor is amplified and then outputted; and
a conductive layer to which the output of said amplifier is applied, said conductive layer facing said first electrode of said electret capacitor and being disposed below said insulating layer.

Claim 8 (Withdrawn): The microphone unit according to claim 7, wherein said conductive layer is an impurity layer formed in the surface of said semiconductor substrate beneath said insulating layer.

Claim 9 (Withdrawn): The microphone unit according to claim 8 further comprising a wiring layer that is disposed above said insulating layer, and extends through said insulating layer to make contact with said conductive layer.

Claim 10 (Withdrawn): The microphone unit according to claim 7, wherein,
said insulating layer has a first insulating film overlying said semiconductor substrate, and a second insulating film overlying said first insulating film, and
said conductive layer is a wiring layer disposed above said first insulating film and below said second insulating film.

Claim 11 (Withdrawn): The microphone unit according to claim 7, wherein said amplifier comprises:

a first transistor having a first current electrode, a second current electrode connected to said second electrode of said electret capacitor, and a control electrode connected to said first electrode of said electret capacitor;

a current source connected to said first current electrode of said first transistor;
and

an inverting amplifier having an input terminal connected to said first current electrode of said first transistor.

Claim 12 (Withdrawn): The microphone unit according to claim 11 wherein said inverting amplifier comprises:

a first resistor having a first terminal connected to said first current electrode of said first transistor, and a second terminal;

a first operational amplifier having a negative input terminal connected to said second terminal of said first resistor, a positive input terminal to which a first fixed potential is applied, and an output terminal; and

a second resistor having a first terminal connected to said negative input terminal of said first operational amplifier, and a second terminal connected to said output terminal of said first operational amplifier.

Claim 13 (Withdrawn): The microphone unit according to claim 11, wherein said current source is a second transistor having a first current electrode to which a second fixed potential is applied, a second current source connected to said first current electrode of said first transistor, and a control electrode to which a third fixed potential is applied.

Claim 14 (Withdrawn): The microphone unit according to claim 11, wherein said amplifier further comprises a voltage follower having an input terminal connected to said first current electrode of said first transistor, and an output terminal connected to said input terminal of said inverting amplifier.

Claim 15 (Withdrawn): The microphone unit according to claim 11 further comprising:

a first diode having a cathode and an anode connected to said first and second electrodes of said electret capacitor, respectively;

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a second diode having an anode and a cathode connected to said first and second electrodes of said electret capacitor, respectively; and

a third resistor connected in parallel with said electret capacitor.